

Analytical Data Package Prepared For
CH2M Hill Plateau Remediation

Radiochemical Analysis By
TestAmerica Inc

2800 G.W. Way, Richland Wa, 99354, (509)-375-3131.

Assigned Laboratory Code: TARL

Data Package Contains 14 Pages

Report No.: 69181

Results in this report relate only to the sample(s) analyzed.

SDG No.	Order No.	Client Sample ID (List Order)	Lot-Sa No.	Work Order	Report DB ID	Batch No.
W07545	F16-042	B35XD4	J6G150407-1	M8XPN1AA	9M8XPN10	6197042
		B35XD4	J6G150407-1	M8XPN1AC	9M8XPN10	6197043
		B35XD4	J6G150407-1	M8XPN1AD	9M8XPN10	6197044
		B35XD4	J6G150407-1	M8XPN1AE	9M8XPN10	6197045



Certificate of Analysis

CH2M Hill Plateau Remediation Company
P.O. Box 1600
Mail Stop – R3-60
Richland, WA 99352

August 18, 2016

Attention: Scot Fitzgerald

SAF Number	:	F16-042
Date SDG Closed	:	July 14, 2016
Number of Samples	:	One (1)
Sample Type	:	Water
SDG Number	:	W07545
Data Deliverable	:	30-Day / Summary

CASE NARRATIVE

I. Introduction

On July 14, 2016, one sample was received at TestAmerica (TARL). Upon receipt, the samples were assigned laboratory ID numbers to correspond with the CH2M specific IDs.

II. Sample Receipt

The samples were received in good condition and no anomalies were noted during check-in.

III. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analyses were:

Gas Proportional Counting
Gross Alpha by method RL-GPC-001
Gross Beta by method RL-GPC-001
Strontium-90 by method RL-GPC-010
Liquid Scintillation Counting
Tritium by method RL-LSC-005

CH2M Hill Plateau Remediation Company
August 18, 2016

IV. Quality Control

The analytical results for each analysis performed includes a minimum of one laboratory control sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

V. Comments

Gas Proportional Counting

Gross Alpha by method RL-GPC-001:

The MDA for sample B35XD4 is equal to the CRDL. The sample result is below the MDA and CRDL. No other analytical or quality issues were noted. Except as noted, the sample results and associated batch QC results are within contractual requirements.

Gross Beta by method RL-GPC-001:

No analytical or quality issues were noted. The sample results and associated batch QC results are within contractual requirements.

Strontium-90 by method RL-GPC-010:

No analytical or quality issues were noted. The sample results and associated batch QC results are within contractual requirements.

Liquid Scintillation Counting

Tritium by method RL-LSC-005:

No analytical or quality issues were noted. The sample results and associated batch QC results are within contractual requirements.

We certify that this data package is in compliance with the SOW, both technically and for completeness, including a full description of, explanation of, and corrective actions for, any and all deviations, from either the analyses requested or the case narrative requested. Release of the data contained in this hard copy data package has been authorized by the Laboratory Analytical Manager (or designee) and the laboratory's client services representative as verified by their signatures on this report.

Reviewed and approved:


Digitally signed by
Steven Campbell
Date: 2016.08.18
13:38:14 -07'00'

Steven Campbell
Project Manager Assistant

Drinking Water Method Cross References

DRINKING WATER ASTM METHOD CROSS REFERENCES		
Referenced Method	Isotope(s)	TestAmerica Richland's SOP No.
EPA 901.1	Cs-134, I-131	RL-GAM-001
EPA 900.0	Alpha & Beta	RL-GPC-001
EPA 00-02	Gross Alpha (Coprecipitation)	RL-GPC-002
EPA 903.0	Total Alpha Radium (Ra-226)	RL-RA-002
EPA 903.1	Ra-226	RL-RA-001
EPA 904.0	Ra-228	RL-RA-001
EPA 905.0	Sr-89/90	RL-GPC-003
ASTM D5174	Uranium	RL-KPA-003
EPA 906.0	Tritium	RL-LSC-005

Results in this report relate only to the sample(s) analyzed.

Uncertainty Estimation

TestAmerica Richland has adopted the internationally accepted approach to estimating uncertainties described in "NIST Technical Note 1297, 1994 Edition". The approach, "Law of Propagation of Errors", involves the identification of all variables in an analytical method which are used to derive a result. These variables are related to the analytical result (R) by some functional relationship, $R = \text{constants} * f(x,y,z,...)$. The components (x,y,z) are evaluated to determine their contribution to the overall method uncertainty. The individual component uncertainties (u_i) are then combined using a statistical model that provides the most probable overall uncertainty value. All component uncertainties are categorized as type A, evaluated by statistical methods, or type B, evaluated by other means. Uncertainties not included in the components, such as sample homogeneity, are combined with the component uncertainty as the square root of the sum-of-the-squares of the individual uncertainties. The uncertainty associated with the derived result is the combined uncertainty (u_c) multiplied by the coverage factor (1,2, or 3).

When three or more sample replicates are used to derive the analytical result, the type A uncertainty is the standard deviation of the mean value (S/\sqrt{n}), where S is the standard deviation of the derived results. The type B uncertainties are all other random or non-random components that are not included in the standard deviation.

The derivation of the general "Law of Propagation of Errors" equations and specific example are available on request.

Report Definitions

Action Lev	An agreed upon activity level used to trigger some action when the final result is greater than or equal to the Action Level. Often the Action Level is related to the Decision Limit.
Batch	The QC preparation batch number that relates laboratory samples to QC samples that were prepared and analyzed together.
Bias	Defined by the equation (Result/Expected)-1 as defined by ANSI N13.30.
COC No	Chain of Custody Number assigned by the Client or TestAmerica.
Count Error (#s)	Poisson counting statistics of the gross sample count and background. The uncertainty is absolute and in the same units as the result. For Liquid Scintillation Counting (LSC) the batch blank count is the background.
CSU (#s) <i>u_c Combined Standard Uncert.</i>	All known uncertainties associated with the preparation and analysis of the sample are propagated to give a measure of the uncertainty associated with the result, <i>u_c the combined standard uncertainty</i> . The uncertainty is absolute and in the same units as the result.
(#s), Coverage Factor	The coverage factor defines the width of the confidence interval, 1, 2 or 3 standard deviations.
CRDL (RL)	Contractual Required Detection Limit as defined in the Client's Statement Of Work or TestAmerica "default" nominal detection limit. Often referred to the reporting level (RL)
Lc	Decision Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume associated with the sample. The Type I error probability is approximately 5%. $Lc = (1.645 * \text{Sqrt}(2 * (\text{BkgrndCnt/BkgrndCntMin}) / \text{SCntMin})) * (\text{ConvFct} / (\text{Eff} * \text{Yld} * \text{Abn} * \text{Vol}) * \text{IngrFct})$. For LSC methods the batch blank is used as a measure of the background variability. Lc cannot be calculated when the background count is zero.
Lot-Sample No	The number assigned by the LIMS software to track samples received on the same day for a given client. The sample number is a sequential number assigned to each sample in the Lot.
MDC MDA MDL	Detection Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume with a Type I and II error probability of approximately 5%. $MDC = (4.65 * \text{Sqrt}((\text{BkgrndCnt/BkgrndCntMin}) / \text{SCntMin}) + 2.71 / \text{SCntMin}) * (\text{ConvFct} / (\text{Eff} * \text{Yld} * \text{Abn} * \text{Vol}) * \text{IngrFct})$. For LSC methods the batch blank is used as a measure of the background variability.
Primary Detector	The instrument identifier associated with the analysis of the sample aliquot.
Ratio U-234/U-238	The U-234 result divided by the U-238 result. The U-234/U-238 ratio for natural uranium in NIST SRM 4321C is 1.038.
Rst/MDC	Ratio of the Result to the MDC. A value greater than 1 may indicate activity above background at a high level of confidence. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Rst/TotUcert	Ratio of the Result to the Total Uncertainty. If the uncertainty has a coverage factor of 2 a value greater than 1 may indicate activity above background at approximately the 95% level of confidence assuming a two-sided confidence interval. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Report DB No	Sample Identifier used by the report system. The number is based upon the first five digits of the Work Order Number .
RER	The equation Replicate Error Ratio = $(S-D)/[\sqrt{TPUs^2 + TPUD^2}]$ as defined by ICPT BOA where S is the original sample result, D is the result of the duplicate, TPUs is the total uncertainty of the original sample and TPUD is the total uncertainty of the duplicate sample.
SDG	Sample Delivery Group Number assigned by the Client or assigned by TestAmerica upon sample receipt.
Sum Rpt Alpha Spec Rst(s)	The sum of the reported alpha spec results for tests derived from the same sample excluding duplicate result where the results are in the same units.
Work Order	The LIMS software assign test specific identifier.
Yield	The recovery of the tracer added to the sample such as Pu-242 used to trace a Pu-239/40 method.

8/18/2016

CH2MHill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F16-042-073		PAGE 1 OF 1																																										
COLLECTOR	Chris Fulton CHPRC	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE	7H	DATA TURNAROUND																																										
SAMPLING LOCATION	C9403, I-007	PROJECT DESIGNATION	100-NR-2 Drilling - Water	TODAK, D	AIR QUALITY	<input type="checkbox"/>	30 Days / 30 Days																																										
ICE CHEST NO.	N/A	FIELD LOGBOOK NO.	HNF-N-645 <u>4</u> - <u>125</u>	ACTUAL SAMPLE DEPTH	SAF NO.	F16-042	METHOD OF SHIPMENT																																										
SHIPPED TO	WestAmerica Incorporated, Richland	OFFSITE PROPERTY NO.	N/A	COA	GOVERNMENT VEHICLE	ORIGINAL	BILL OF LADING/AIR BILL NO.																																										
MATRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS *Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/ATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1. NA																																																
D=Air L=Drum Liquid DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	<table border="1"> <thead> <tr> <th colspan="2">PRESERVATION</th> <th>HNO3 to pH <2</th> <th>HNO3 to pH <2</th> <th colspan="3">None</th> </tr> </thead> <tbody> <tr> <td colspan="2">HOLDING TIME</td> <td>6 Months</td> <td>6 Months</td> <td colspan="3">6 Months</td> </tr> <tr> <td colspan="2">TYPE OF CONTAINER</td> <td>G/P</td> <td>G/P</td> <td colspan="3">P</td> </tr> <tr> <td colspan="2">NO. OF CONTAINER(S)</td> <td>1</td> <td>3</td> <td colspan="3">1</td> </tr> <tr> <td colspan="2">VOLUME</td> <td>1L</td> <td>1L</td> <td colspan="3">1L</td> </tr> <tr> <td colspan="2">SAMPLE ANALYSIS</td> <td>SEE ITEM (1) IN SPECIAL INSTRUCTIONS</td> <td>SEE ITEM (2) IN SPECIAL INSTRUCTIONS</td> <td colspan="3">TRITIUM_DIST_LSC_COMMON</td> </tr> </tbody> </table>							PRESERVATION		HNO3 to pH <2	HNO3 to pH <2	None			HOLDING TIME		6 Months	6 Months	6 Months			TYPE OF CONTAINER		G/P	G/P	P			NO. OF CONTAINER(S)		1	3	1			VOLUME		1L	1L	1L			SAMPLE ANALYSIS		SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	TRITIUM_DIST_LSC_COMMON		
PRESERVATION		HNO3 to pH <2	HNO3 to pH <2	None																																													
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VOLUME		1L	1L	1L																																													
SAMPLE ANALYSIS		SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	TRITIUM_DIST_LSC_COMMON																																													
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME																																														
B38XD4	WATER	JUL 13 2016	1146	✓	✓	✓	✓																																										
 																																																	
SIGN/ PRINT NAMES				SPECIAL INSTRUCTIONS																																													
RELINQUISHED BY/REMOVED FROM CHPRC	JUL 13 2016	RECEIVED BY/STORED IN SSU-1	DATE/TIME JUL 14 2016 10:15	DATE/TIME JUL 13 2016 13:43	(1) ALPHA_GPC: COMMON {Gross alpha}; BETA_GPC: COMMON {Gross beta}; (2) SRTTOT_SEP_PRECIP_GPC: COMMON {Total beta radiostrontium};																																												
RELINQUISHED BY/REMOVED FROM SSU-1	JUL 14 2016	RECEIVED BY/STORED IN Troy Bacon CHPRC	DATE/TIME JUL 14 2016 10:15	DATE/TIME JUL 14 2016 10:45																																													
RELINQUISHED BY/REMOVED FROM Troy Bacon CHPRC	JUL 14 2016	RECEIVED BY/STORED IN Troy Bacon CHPRC	DATE/TIME JUL 14 2016 10:15	DATE/TIME JUL 14 2016 10:20																																													
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RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME																																														
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME																																														
LABORATORY SECTION	RECEIVED BY	TITLE																																															
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY																																															

Sample Check-in List

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Date/Time Received: 7-14-14 / 1420 Container GM Screen Result: (Airlock) O cpm Initials B
 Sample GM Screen Result (Sample Receiving) O cpm Initials B

Client: FLH SDG #: W07545 SAF #: F16-042 NA []

Lot Number: J16G150407

Chain of Custody # F16-042-073

Shipping Container ID or Air Bill Number : NA B

Samples received inside shipping container/cooler/box
 Yes B Continue with 1 through 4. Initial appropriate response.
 No [] Go to 5, add comment to #16.

1. Custody Seals on shipping container intact? Yes [] No [] No Custody Seal B
2. Custody Seals dated and signed? Yes [] No [] No Custody Seal B
3. Cooler temperature: 4.3 °C ICE NA []
4. Vermiculite/packing materials is NA B Wet [] Dry []

Item 5 through 16 for samples. Initial appropriate response.

5. Chain of Custody record present? Yes B No []
6. Number of samples received (Each sample may contain multiple bottles): 1
7. Containers received: 5 X LP

8. Sample holding times exceeded? NA [] Yes [] No B
9. Samples have: tape hazard labels B custody seals B appropriate sample labels
10. Matrix: A (FLT, Wipe, Solid, Soil) B I (Water) S (Air, Niosh 7400) T (Biological, Ni-63)

11. Samples:
B are in good condition _____ are leaking _____ are broken
B have air bubbles (Only for samples requiring no head space) _____ Other _____

12. Sample pH appropriate for analysis requested Yes B No [] NA []
 (If acidification is necessary go to pH area & document sample ID, initial pH, amount of HNO₃ added and pH after addition on table)
13. Were any anomalies identified in sample receipt? Yes [] No B
14. Description of anomalies (include sample numbers): NA B

15. Sample Location, Sample Collector Listed on COC? * Yes B No []
 *For documentation only. No corrective action needed.

16. Additional Information: WPA

[] Client/Courier denied temperature check.

B Client/Courier unpack cooler.

Sample Check-in List completed by Sample Custodian:
 Signature: J. Gibbons Date: 7-14-14

Client Notification needed? Yes [] No B Date: _____
 By: _____
 Person contacted: _____

B No action necessary; process as is

Project Manager STM CPM Date 7/15/16

Sample Results Summary

TestAmerica Inc TARL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 69181

SDG No: W07545

Batch	Client Id Work Order	Parameter	Result +- CSU (2 s)		Qual	Units	Tracer Yield	MDL	CRDL	RPD		
6197044 SRTOT_SEP_PRECIP_GPC												
B35XD4												
M8XPN1AD	STRONTIUM		5.68E-01	+- 5.9E-01	U	pCi/L	91%	9.16E-01	2.00E+00			
B35XD4 DUP												
M8XPN1AH	STRONTIUM		4.78E-01	+- 5.3E-01	U	pCi/L	94%	8.46E-01	2.00E+00	17.2		
6197042 9310_ALPHABETA_GPC												
B35XD4												
M8XPN1AA	Alpha		2.36E+00	+- 2.0E+00	U	pCi/L	100%	3.00E+00	3.00E+00			
B35XD4 DUP												
M8XPN1AF	Alpha		1.28E+00	+- 1.7E+00	U	pCi/L	100%	2.75E+00	3.00E+00	59.3		
6197043 9310_ALPHABETA_GPC												
B35XD4												
M8XPN1AC	Beta		5.99E+00	+- 1.6E+00		pCi/L	100%	1.90E+00	4.00E+00			
B35XD4 DUP												
M8XPN1AG	Beta		6.01E+00	+- 1.6E+00		pCi/L	100%	1.89E+00	4.00E+00	0.3		
6197045 TRITIUM_DIST_LSC												
B35XD4												
M8XPN1AE	H-3		9.90E+02	+- 2.1E+02		pCi/L	100%	3.45E+02	7.00E+02			
B35XD4 DUP												
M8XPN1AK	H-3		1.01E+03	+- 2.1E+02		pCi/L	100%	3.45E+02	7.00E+02	1.9		
No. of Results: 8												

QC Results Summary

TestAmerica Inc TARL

Ordered by Method, Batch No, QC Type,.

Report No. : 69181

SDG No.: W07545

Batch	Work Order	Parameter	Result +- CSU (2 s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
SRTOT_SEP_PRECIP_GPC									
6197044	BLANK QC,	M8XTP1AA	STRONTIUM		4.04E-01 +- 5.5E-01	U	pCi/L	94%	9.03E-01
6197044	LCS,	M8XTP1AC	STRONTIUM		1.30E+01 +- 3.3E+00		pCi/L	82%	95%
9310_ALPHABETA_GPC									
6197042	BLANK QC,	M8XTL1AA	Alpha		1.68E-01 +- 5.1E-01	U	pCi/L	100%	8.78E-01
6197042	LCS,	M8XTL1AC	Alpha		2.14E+01 +- 5.5E+00		pCi/L	100%	97%
9310_ALPHABETA_GPC									
6197043	BLANK QC,	M8XTN1AA	Beta		-9.09E-02 +- 9.8E-01	U	pCi/L	100%	1.69E+00
6197043	LCS,	M8XTN1AC	Beta		1.89E+01 +- 2.9E+00		pCi/L	100%	89%
TRITIUM_DIST_LSC									
6197045	MATRIX SPIKE, B35XD4	M8XPN1AJ	H-3		1.33E+03 +- 3.6E+02		pCi/L	100%	89%
6197045	BLANK QC,	M8XTQ1AA	H-3		6.94E+01 +- 1.7E+02	U	pCi/L	100%	3.56E+02
6197045	LCS,	M8XTQ1AC	H-3		2.71E+03 +- 2.8E+02		pCi/L	100%	0.0
No. of Results: 9									

FORM I
SAMPLE RESULTS

Date: 18-Aug-16

Lab Name: TestAmerica Inc
 Lot-Sample No.: J6G150407-1
 Client Sample ID: B35XD4

SDG: W07545
 Report No.: 69181
 COC No.: F16-042-073

Ordered by Client Sample ID, Batch No.												
Parameter	Result	Qual	Count (2 s)	CSU (2 s)	MDL, Action Lev	Rpt Unit Lc	Yield CRDL(RL)	Rst/MDL, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 6197042	9310_ALPHABETA_GPC			Work Order: M8XPN1AA		Report DB ID: 9M8XPN10						
Alpha	2.36E+00	U	1.9E+00	2.0E+00	3.00E+00	pCi/L	100%	0.79	8/17/16 08:46 a	0.1291	GPC24C	
					1.37E+00	3.00E+00	(2.3)			L		
Batch: 6197043	9310_ALPHABETA_GPC			Work Order: M8XPN1AC		Report DB ID: 9M8XPN10						
Beta	5.99E+00		1.4E+00	1.6E+00	1.90E+00	pCi/L	100%	(3.2)	8/16/16 09:53 a	0.2034	GPC26A	
					9.10E-01	4.00E+00	(7.7)			L		
Batch: 6197044	SRTOT_SEP_PRECIP_GPC			Work Order: M8XPN1AD		Report DB ID: 9M8XPN10						
STRONTIUM	5.68E-01	U	5.7E-01	5.9E-01	9.16E-01	pCi/L	91%	0.62	8/11/16 05:41 p	0.5039	GPC31C	
					4.17E-01	2.00E+00	(1.9)			L		
Batch: 6197045	TRITIUM_DIST_LSC			Work Order: M8XPN1AE		Report DB ID: 9M8XPN10						
H-3	9.90E+02		1.8E+02	2.1E+02	3.45E+02	pCi/L	100%	(2.9)	7/30/16 04:56 a	0.00502	LSC10	
					1.64E+02	7.00E+02	(9.4)			L		

No. of Results: 4 Comments:

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DUPLICATE RESULTS

Lab Name: TestAmerica Inc
 Lot-Sample No.: J6G150407-1
 Client Sample ID: B35XD4 DUP

SDG: W07545
 Report No. : 69181
 COC No. : F16-042-073

Parameter	Result, Orig Rst	Count (2 s)	CSU (2 s)	MDL, Action Lev	Rpt Unit, CRDL	Rst/MDL, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 6197042	9310_ALPHABETA_GPC		Work Order: M8XPN1AF		Report DB ID: M8XPN1FR		Orig Sa DB ID: 9M8XPN10			
Alpha	1.28E+00	U	1.7E+00	2.75E+00	pCi/L	100%	8/17/16 08:00 p	0.47		GPC24A
	2.36E+00	U	RPD 59.3		3.00E+00	(1.5)			L	
Batch: 6197043	9310_ALPHABETA_GPC		Work Order: M8XPN1AG		Report DB ID: M8XPN1GR		Orig Sa DB ID: 9M8XPN10			
Beta	6.01E+00	1.4E+00	1.6E+00	1.89E+00	pCi/L	100%	(3.2)	8/16/16 09:53 a		0.2032 GPC26B
	5.99E+00	RPD 0.3			4.00E+00	(7.7)			L	
Batch: 6197044	SRTOT_SEP_PRECIP_GPC		Work Order: M8XPN1AH		Report DB ID: M8XPN1HR		Orig Sa DB ID: 9M8XPN10			
STRONTIUM	4.78E-01	U	5.2E-01	8.46E-01	pCi/L	94%	0.56	8/11/16 05:41 p		0.5069 GPC31D
	5.68E-01	U	RPD 17.2		2.00E+00	(1.8)			L	
Batch: 6197045	TRITIUM_DIST_LSC		Work Order: M8XPN1AK		Report DB ID: M8XPN1KR		Orig Sa DB ID: 9M8XPN10			
H-3	1.01E+03	1.8E+02	2.1E+02	3.45E+02	pCi/L	100%	(2.9)	7/30/16 07:46 a		0.00501 LSC10
	9.90E+02	RPD 1.9			7.00E+02	(9.6)			L	

No. of Results: 4 Comments:

FORM II**BLANK RESULTS**

Date: 18-Aug-16

8/18/2016

Lab Name: TestAmerica Inc
Matrix: WATER

SDG: W07545
Report No.: 69181

Parameter	Result	Qual	Count (2 s)	CSU (2 s)	MDL, Lc	Rpt Unit, CRDL	Rst/MDL, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 6197045	TRITIUM_DIST_LSC	U	1.5E+02	1.7E+02	3.56E+02	pCi/L	100%	0.19	7/30/16 09:11 a	0.00502	LSC10
H-3	6.94E+01	U			1.69E+02	7.00E+02					
Batch: 6197042	9310_ALPHABETA_GPC			Work Order: M8XTQ1AA	Report DB ID: M8XTQ1AB						
Alpha	1.68E-01	U	5.1E-01	5.1E-01	8.78E-01	pCi/L	100%	0.19	8/17/16 08:00 p	0.2012	GPC24B
				4.00E-01	3.00E+00						
Batch: 6197043	9310_ALPHABETA_GPC			Work Order: M8XTN1AA	Report DB ID: M8XTN1AB						
Beta	-9.09E-02	U	9.8E-01	9.8E-01	1.69E+00	pCi/L	100%	-0.05	8/16/16 09:53 a	0.2054	GPC26C
				8.10E-01	4.00E+00						
Batch: 6197044	SRTOT_SEP_PRECIP_GPC			Work Order: M8XTP1AA	Report DB ID: M8XTP1AB						
STRONTIUM	4.04E-01	U	5.5E-01	5.5E-01	9.03E-01	pCi/L	94%	0.45	8/11/16 05:41 p	0.5144	GPC32A
				4.11E-01	2.00E+00						

No. of Results: 4 Comments:

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TestAmerica Inc MDC|MDA|Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
 rptSTLRchBlank U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncrt, RDL or not identified by gamma scan software.
 V5.6 A2002

FORM II
LCS RESULTS

Date: 18-Aug-16

8/18/2016

Lab Name: TestAmerica Inc
Matrix: WATER

SDG: W07545
Report No.: 69181

Parameter	Result	Count	CSU (2 s)	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Primary Detector
Batch: 6197045 H-3	TRITIUM_DIST_LSC	2.71E+03	2.4E+02	Work Order: M8XTQ1AC 2.8E+02 3.53E+02 pCi/L	Report DB ID: M8XTQ1CS 100%	2.71E+03 8.13E+01	100%	7/30/16 10:35 a	0.00502	L	LSC10
Batch: 6197042 Alpha	9310_ALPHABETA_GPC	2.14E+01	1.6E+00	Work Order: M8XTL1AC 5.5E+00 8.69E-01 pCi/L	Report DB ID: M8XTL1CS Rec Limits: 80 120	100% 0.0	2.20E+01 2.22E-01	97%	8/17/16 08:00 p	0.2045	GPC24C
Batch: 6197043 Beta	9310_ALPHABETA_GPC	1.89E+01	1.6E+00	Work Order: M8XTN1AC 2.9E+00 1.52E+00 pCi/L	Report DB ID: M8XTN1CS Rec Limits: 80 120	100% 0.0	2.13E+01 1.52E-01	89%	8/16/16 09:53 a	0.2122	GPC26D
Batch: 6197044 STRONTIUM	SRTOT_SEP_PRECIP_GPC	1.30E+01	1.4E+00	Work Order: M8XTP1AC 3.3E+00 9.93E-01 pCi/L	Report DB ID: M8XTP1CS Rec Limits: 80 120	82% -0.1	1.36E+01 9.67E-02	95%	8/11/16 05:41 p	0.5062	GPC32B
No. of Results: 4		Comments:									

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FORM II**MATRIX SPIKE RESULTS**

Date: 18-Aug-16

Lab Name: TestAmerica Inc

Lot-Sample No.: J6G150407-1, B35XD4

SDG: W07545

Report No. : 69181

Parameter	SpikeResult, Orig Rst	Count Error (2 s)	CSU (2 s)	MDCIMDA	Rpt Unit	Yield	Rec- over	Expected, Uncert	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 6197045 H-3	Work Order: M8XPN1AU 1.33E+03	2.5E+02 9.90E+02	Report DB ID: M8XPN1JW 3.6E+02	4.04E+02	pCi/L	Orig Sa DB ID: 9M8XPN10 100%	88.51%	1.51E+03 4.52E+01	7/30/16 06:21 a	0.0043 L	TRITIUM_DIST_LSC LSC10

Number of Results: 1

Comments:

8/18/2016

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TestAmerica Inc RER - Replicate Error Ratio = $(S-D)/[\sqrt{(\sum D)^2 + \sum (D-U)^2}]$ as defined by ICPT BOA.
 rptSTLRchMs Bias - (Result/Expected)-1 as defined by ANSI N13.30.